

WHAT IS CLAIMED IS:

1. An optical recording medium, comprising:  
lands and grooves,

said optical recording medium at least being reproducible by either of i) a first optical pickup device provided with a light source for emitting a light beam having a first wavelength  $\lambda_1$ , and a photodetector having a receiving light sensitivity  $s_1$  with respect to the first wavelength  $\lambda_1$ , and ii) a second optical pickup device provided with a light source for emitting a light beam having a second wavelength  $\lambda_2$  which is shorter than the first wavelength  $\lambda_1$ , and a photodetector having a receiving light sensitivity  $s_2$  with respect to the second wavelength  $\lambda_2$ , which is lower than the receiving light sensitivity  $s_1$ ,

wherein said grooves are formed in such depth that both of a signal outputted from said photodetector of said first optical pickup device and a signal outputted from said photodetector of said second optical pickup device have not less than a predetermined level.

2. The optical recording medium as set forth in claim 1, wherein:

said predetermined level is within a range of from 0.5 to 0.55 times of a maximum level of the signal

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outputted from said photodetector of said first optical pickup device.

3. The optical recording medium as set forth in claim 1, satisfying the condition of:

$$s2/s1 \geq 0.73.$$

4. The optical recording medium as set forth in claim 1, satisfying the condition of:

$$s2/s1 \geq 0.57.$$

5. The optical recording medium as set forth in claim 1, wherein:

information can be recorded on both said lands and grooves.

6. The optical recording medium as set forth in claim 1, wherein:

said lands and grooves are formed in virtually same width.

7. The optical recording medium as set forth in claim 1, wherein:

said grooves are formed in width within a range of from 0.5  $\mu\text{m}$  to 0.6  $\mu\text{m}$ .

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8. The optical recording medium as set forth in claim 1, wherein:

said lands are formed in width within a range of from 0.5  $\mu\text{m}$  to 0.6  $\mu\text{m}$ .

9. The optical recording medium as set forth in claim 6, wherein:

an interval between centers of adjacent grooves is not less than 1.95 times of a beam spot diameter of the light beam having the second wavelength  $\lambda_2$ .

10. The optical recording medium as set forth in claim 1 being a super-resolution magnetic medium.

11. An optical recording medium, comprising:  
lands and grooves,

said optical recording medium at least being reproducible by either of i) a light beam having a first wavelength  $\lambda_1$ , and ii) a light beam having a second wavelength  $\lambda_2$  which is shorter than the first wavelength  $\lambda_1$ ,

wherein said groove depth  $d$  satisfies the conditions of:

$$\lambda_1/n_1 \times (3/64) \leq d \leq \lambda_1/n_1 \times (13/64); \text{ and}$$

$$\lambda_2/n_2 \times (4/64) \leq d \leq \lambda_2/n_2 \times (12/64),$$

wherein  $n_1$  and  $n_2$  indicate refractive indexes of

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said optical recording medium for the first wavelength  $\lambda_1$  and the second wavelength  $\lambda_2$  respectively.

12. The optical recording medium as set forth in claim 11, wherein:

the first wavelength  $\lambda_1$  is set within a range of from 630 nm to 680 nm.

13. The optical recording medium as set forth in claim 11, wherein:

the second wavelength  $\lambda_2$  is set within a range of from 390 nm to 430 nm.

14. The optical recording medium as set forth in claim 11, wherein:

said groove depth  $d$  satisfies the conditions of:

$\lambda_1/n_1 \times (3/64) \leq d \leq \lambda_1/n_1 \times (13/64)$ ; and

$\lambda_2/n_2 \times (6/64) \leq d \leq \lambda_2/n_2 \times (10/64)$ .

15. The optical recording medium as set forth in claim 11, wherein:

information can be recorded on both said lands and grooves.

16. The optical recording medium as set forth in claim 11, wherein:

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said lands and grooves are formed in virtually same width.

17. The optical recording medium as set forth in claim 16, wherein:

an interval between centers of adjacent grooves is not less than 1.95 times of a beam spot diameter of the light beam having the second wavelength  $\lambda_2$ .

18. The optical recording medium as set forth in claim 11 being a super-resolution magnetic medium.

19. An optical recording medium, comprising:

lands and grooves,

said optical recording medium at least being reproducible by either of i) a light beam having a first wavelength  $\lambda_1$ , and ii) a light beam having a second wavelength  $\lambda_2$  which is shorter than the first wavelength  $\lambda_1$ ,

wherein said grooves are formed in width within a range of from 0.5  $\mu\text{m}$  to 0.6  $\mu\text{m}$ , and in depth  $d$  within a range of from 19.4 nm to 47.5 nm.

20. The optical recording medium as set forth in claim 19, wherein:

said grooves are formed in depth  $d$  within a range

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of from 19.4 nm to 45 nm.

21. The optical recording medium as set forth in claim 19, wherein:

said grooves are formed in depth  $d$  within a range of from 23.7 nm to 39.5 nm.

22. The optical recording medium as set forth in claim 19, wherein:

the first wavelength  $\lambda_1$  is set within a range of from 630 nm to 680 nm.

23. The optical recording medium as set forth in claim 19, wherein:

the second wavelength  $\lambda_2$  is set within a range of from 390 nm to 430 nm.

24. The optical recording medium as set forth in claim 19, wherein:

information can be recorded on both said lands and grooves.

25. The optical recording medium as set forth in claim 19, wherein:

said lands and grooves are formed in virtually same width.

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26. The optical recording medium as set forth in claim 25, wherein:

an interval between centers of adjacent grooves is not less than 1.95 times of a beam spot diameter of the light beam having the second wavelength  $\lambda_2$ .

27. The optical recording medium as set forth in claim 19 being a super-resolution magnetic medium.

28. An optical recording medium, comprising:  
lands and grooves,

said optical recording medium at least being reproducible by either of i) a light beam having a first wavelength  $\lambda_1$ , and ii) a light beam having a second wavelength  $\lambda_2$  which is shorter than the first wavelength  $\lambda_1$ ,

wherein said groove depth  $d$  satisfies the condition of:

$$\lambda_1/n_1 \times (3/64) \leq d \leq \lambda_1/n_1 \times (13/64),$$

wherein  $n_1$  indicates a refractive index of said optical recording medium for the first wavelength  $\lambda_1$ ,  
and

a reflective index  $r_1$  of said optical recording medium with respect to the first wavelength  $\lambda_1$  is smaller than a reflective index  $r_2$  with respect to the second wavelength  $\lambda_2$ .

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29. The optical recording medium as set forth in claim 28, wherein:

the first wavelength  $\lambda_1$  is set within a range of from 630 nm to 680 nm.

30. The optical recording medium as set forth in claim 28, wherein:

the second wavelength  $\lambda_2$  is set within a range of from 390 nm to 430 nm.

31. The optical recording medium as set forth in claim 28, wherein:

information can be recorded on both said lands and groove.

32. The optical recording medium as set forth in claim 28, wherein:

said lands and grooves are formed in virtually same width.

33. The optical recording medium as set forth in claim 32, wherein:

an interval between centers of adjacent grooves is not less than 1.95 times of a beam spot diameter of the light beam having the second wavelength  $\lambda_2$ .

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34. The optical recording medium as set forth in claim 28 being a super-resolution magnetic medium.

35. An optical recording medium, comprising:  
lands and grooves,

said optical recording medium at least being reproducible by either of i) a light beam having a first wavelength  $\lambda_1$ , and ii) a light beam having a second wavelength  $\lambda_2$  which is shorter than the first wavelength  $\lambda_1$ ,

wherein said groove depth  $d$  satisfies the condition of:

$$\lambda_1/n_1 \times (3/64) \leq d \leq \lambda_1/n_1 \times (13/64),$$

wherein  $n_1$  indicates a refractive index of said optical recording medium for the first wavelength  $\lambda_1$ ,  
and

a reproducing power  $p_1$  of said optical recording medium set for the first wavelength  $\lambda_1$  is lower than a reproducing power  $p_2$  set for the second wavelength  $\lambda_2$ .

36. The optical recording medium as set forth in claim 35, wherein:

the first wavelength  $\lambda_1$  is set within a range of from 630 nm to 680 nm.

37. The optical recording medium as set forth in

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claim 35, wherein:

the second wavelength  $\lambda_2$  is set within a range of  
from 390 nm to 430 nm.

38. The optical recording medium as set forth in  
claim 35, wherein:

information can be recorded on both said lands and  
grooves.

39. The optical recording medium as set forth in  
claim 35, wherein:

said lands and grooves are formed in virtually  
same width.

40. The optical recording medium as set forth in  
claim 39, wherein:

an interval between centers of adjacent grooves is  
not less than 1.95 times of a beam spot diameter of the  
light beam having the second wavelength  $\lambda_2$ .

41. The optical recording medium as set forth in  
claim 35 being a super-resolution magnetic medium.

42. An optical recording medium, comprising:

lands and grooves,

said optical recording medium at least being

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reproducible by either of i) a light beam having a first wavelength  $\lambda_1$ , and ii) a second beam having a second wavelength  $\lambda_2$  which is shorter than the first wavelength  $\lambda_1$ ,

wherein said groove depth  $d$  satisfies the condition of:

$$\lambda_1/n_1 \times (3/64) \leq d \leq \lambda_1/n_1 \times (13/64),$$

wherein  $n_1$  indicates a refractive index of said optical recording medium for the first wavelength  $\lambda_1$ , and

a reflective index  $r_1$  of said optical recording medium with respect to the first wavelength  $\lambda_1$  and a reflective index  $r_2$  with respect to the second wavelength  $\lambda_2$  satisfy the condition of:

$$r_2 \times p_2 > r_1 \times p_1,$$

wherein  $p_1$  is a reproducing power of said optical recording medium set for the first wavelength  $\lambda_1$  and  $p_2$  is a reproducing power set for the second wavelength  $\lambda_2$ .

43. The optical recording medium as set forth in claim 42, wherein:

the first wavelength  $\lambda_1$  is set within a range of from 630 nm to 680 nm.

44. The optical recording medium as set forth in

claim 42, wherein:

the second wavelength  $\lambda_2$  is set within a range of from 390 nm to 430 nm.

45. The optical recording medium as set forth in claim 42, wherein:

information can be recorded on both said lands and grooves.

46. The optical recording medium as set forth in claim 42, wherein:

said lands and grooves are formed in virtually same width.

47. The optical recording medium as set forth in claim 46, wherein:

an interval between centers of adjacent grooves is not less than 1.95 times of a beam spot diameter of the light beam having the second wavelength  $\lambda_2$ .

48. The optical recording medium as set forth in claim 42 being a super-resolution magnetic medium.

49. An optical pickup device for recording and reproducing information with respect to the optical recording medium of claim 11, comprising:

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a light source for emitting the light beam having the second wavelength  $\lambda_2$ , and

a photodetector for receiving light reflected from said optical recording medium,

wherein said photodetector has a receiving light sensitivity  $s_2$  with respect to the second wavelength  $\lambda_2$  satisfying the condition of:

$$s_2/s_1 \geq 0.73,$$

wherein  $s_1$  is a receiving light sensitivity of said photodetector with respect to the first wavelength  $\lambda_1$ .

50. An optical pickup device for recording and reproducing information with respect to the optical recording medium of claim 14, comprising:

a light source for emitting the light beam having the second wavelength  $\lambda_2$ , and

a photodetector for receiving light reflected from said optical recording medium,

wherein said photodetector has a receiving light sensitivity  $s_2$  with respect to the second wavelength  $\lambda_2$  satisfying the condition of:

$$s_2/s_1 \geq 0.57,$$

wherein  $s_1$  is a receiving light sensitivity of said photodetector with respect to the first wavelength  $\lambda_1$ .

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51. An optical pickup device for recording and reproducing information with respect to the optical recording medium of claim 19, comprising:

a light source for emitting the light beam having the second wavelength  $\lambda_2$ , and

a photodetector for receiving light reflected from said optical recording medium,

wherein said photodetector has a receiving light sensitivity  $s_2$  with respect to the second wavelength  $\lambda_2$  satisfying the condition of:

$$s_2/s_1 \geq 0.73,$$

wherein  $s_1$  is a receiving light sensitivity of said photodetector with respect to the first wavelength  $\lambda_1$ .

52. An optical pickup device for recording and reproducing information with respect to the optical recording medium of claim 21, comprising:

a light source for emitting the light beam having the second wavelength  $\lambda_2$ , and

a photodetector for receiving light reflected from said optical recording medium,

wherein said photodetector has a receiving light sensitivity  $s_2$  with respect to the second wavelength  $\lambda_2$  satisfying the condition of:

$$s_2/s_1 \geq 0.57,$$

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wherein  $s_1$  is a receiving light sensitivity of said photodetector with respect to the first wavelength  $\lambda_1$ .

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